

Supporting Information

Mott-Schottky measurement

During the measurement, 15 mg powders of BiVO₄, Au-BiVO₄ and CoS-Au-BiVO₄ were separately dispersed in solution consisted of 20 μL Nafion, 490 μL ethanol and 490 pure water and deposited on FTO electrode. Then the samples were dried at 60°C and used as working electrodes. The electrode potential of the reference is +0.197 V, thus, the flat band of sample is calculated by

$$E_f(\text{vs NHE}) = \left(\text{vs } \frac{\text{Ag}}{\text{AgCl}} \right) + 0.1978$$

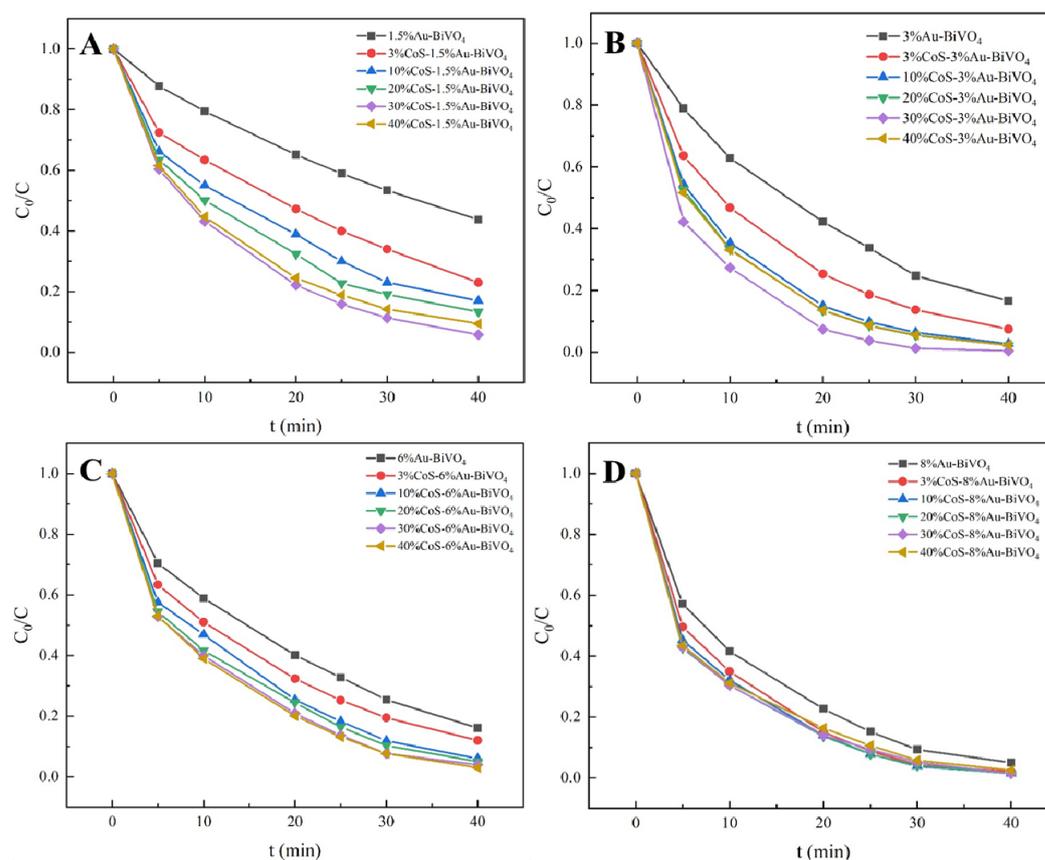


Figure S1. Photodegradation of RhB by different synthesized samples of (A) wt%CoS-1.5%Au-BiVO₄, (B) wt%CoS-3%Au-BiVO₄, (C)wt%CoS-6%Au-BiVO₄ and (D) wt%CoS-8%Au-BiVO₄.

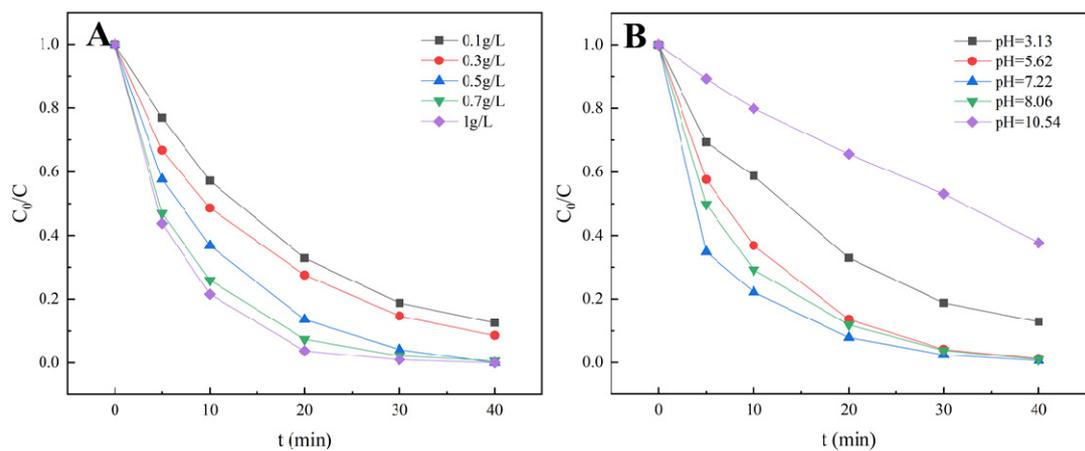


Figure S2. Effects of catalyst dosage (A) and pH (B) for degradation of RhB by CoS-Au-BiVO₄ /PMS/Vis.

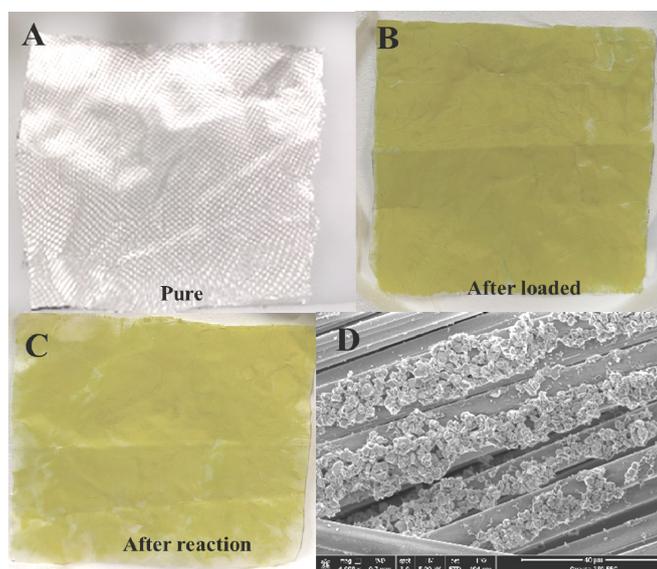


Figure S3. The pictures of pure and prepared glass fiber (A)~(B); The picture and SEM image of glass fiber after reaction (C)~(D).

Table S1. The atomic concentrations of elements in CoS-Au-BiVO₄

Elements	Bi	V	O	Au	Co	S	C
Atoms proportion (%)	6.3	4.6	29.5	2.9	5.3	5.9	45.5

Table S2. The Co ion concentrations in solutions after cycling experiments

	Cycle 1	Cycle 2	Cycle 3
Co ion concentrations/(mg/L)	0.2	0.08	0

Table S3. Water quality parameters of wastewater

Categories	Parameters
pH	5
TOC	151 mg/L
Dissolving salts	36 mg/L
Suspended solids	8 mg/L

Table S4. The weight of photocatalysts in samples of C1~C5

Samples	Weight of photocatalysts / g
C1	0.13
C2	0.44
C3	0.64
C4	0.82
C5	0.99